

Amendments to Drawings

Please replace the sheets 2 and 3 drawings with the replacement sheets 2 and 3, showing Figs. 2A and 2B. The replacement sheets are submitted herewith in order to conform the drawings with the specification and with 37 CFR 1.84. No new matter has been added.

REMARKS/ARGUMENTS

This paper is submitted in response to the Office Action mailed May 12, 2008. A Request for a Three Month Extension of Time under 37 CFR 1.136(a) is submitted herewith, along with the fee prescribed by 37 CFR 1.17(a)(3). The response is therefore timely.

Claims 1-11 were examined. All were rejected under 35 U.S.C. §103(a) as unpatentable over US 2003/0006148 (now US Pat. 6936158) – Nielsen et al. in view of US 2003/0169058 – Pierre et al. and in further view of US 5821742 – Carr. In response, the claims have been amended, and reconsideration is respectfully requested.

Rejection under Section 103(a)

Claims 1-7 relate to a method of diagnosing a corrosion risk for a pipe or a pipeline buried in soil due to DC stray currents and/or AC voltages induced in the soil. Claims 8-11 relate to a system for carrying out the diagnosing method of claims 1-7. Thus, the Applicant's claimed invention relates to diagnosing the risk of corrosion of a length of buried pipe. Both the Nielsen et al. and the Pierre et al. references, by contrast, relate to the measurement of accumulated corrosion and/or the instantaneous rate of corrosion. Neither of these references, however, would allow for the prediction of future corrosion by the real-time measurement of electrical parameters associated with the buried pipe. Thus, the present invention, unlike the prior art, makes predictions of future corrosion behavior based on the evaluation of real-time measurements of certain electrical parameters. As will be appreciated from the following discussion, the aforementioned difference between the claimed invention and the cited references is of patentable significance.

The Examiner first addresses the system claims (claims 8-11). Claim 8 was rejected on the grounds that Nielsen et al. discloses all of the limitations of the claim except the AC current measuring circuit, the AC voltage measuring circuit, and the resistance measuring circuit. Pierre et al. was cited for its disclosure of the aforementioned circuits for measuring AC current, AC voltage, and resistance. It was the Examiner's position that it would have been obvious to employ the measuring circuits of Pierre et al. in the apparatus of Nielsen et al. Applicant respectfully disagrees.

First, the Applicant respectfully disagrees with the Examiner's assertion that Nielsen et al. discloses a diagnosing circuit that is operable for diagnosing the risk of corrosion based on an empirical combination of the actual corrosion of the first (exposed) probe part, the spread resistance, and the measured AC voltage. The Examiner cites paragraph [0183] of Nielsen et al. in support of this position. A careful reading of that paragraph, however, reveals that the processor in Nielsen et al. merely employs the disclosed formula to "calculate the degree of metal gain or metal loss (corrosion)...." Thus, the processor in Nielsen et al. does nothing more than provide a static measurement of the amount of corrosion at a particular point in time. There is no suggestion in Nielsen et al. that the processor is operable to diagnose a corrosion risk, or that it is operable to provide such a diagnosis based on an empirical combination of (a) a calculated value of the actual corrosion of the first probe part; (b) the calculated spread resistance; and (c) the measured AC voltage, as defined in claim 8. Neither is there any suggestion in the cited art that any combination of the references would provide any mechanism by which a corrosion risk diagnosis may be provided, as defined in claim 8.

To make the distinction between the claimed invention and the cited art more clear, claim 8 has been amended to recite positively a data processor that determines the actual corrosion of the first probe part, which parameter is used by the diagnosing circuit. Accordingly, it is now clear that the diagnosing circuit is separate and distinct from the part of the system that determines the actual corrosion of the first probe part.

Claim 8 has been further amended to define the system as including "a switching device operable for the selective electrical connection and disconnection of said two-part metal probe and said pipe or pipeline...." The current measuring circuit is now defined as being operable while the probe is electrically connected to the pipe or pipeline, and the voltage measuring circuit and the current excitation circuit are now defined as being operable while the probe is electrically disconnected from the pipe or pipeline. Support for these limitations is found in the specification at page 13, line 13 through page 14, line 10 (paragraphs [0050] through [0054] of Application Publication No. 2008/0036476), and in Fig. 2A. (Fig. 2A has been amended by adding reference numbers 35, 37, and 39 to indicate the switching devices shown schematically in the drawing figure as filed, and the specification has been amended accordingly, as set forth above.) It is respectfully submitted that neither Nielsen et al. nor Pierre et al. provides for a switching mechanism or device that allows the probe to be selectively connected to the pipe for an AC cur-

rent measurement, and then disconnected from the pipe for an AC voltage measurement and for a resistance measurement, as defined in amended claim 8.

In view of the foregoing, it is respectfully submitted that claim 8, as amended, defines patentably over the art of record and should be allowed. Claims 9-11, which depend from claim 8 and further define the patentable subject matter of the claimed invention, should likewise be allowed.

Claim 1 was rejected on same grounds as claim 8, on the basis that the method defined in claim 1 “is intrinsic to the apparatus disclosed in claim 8.” Assuming, for the sake of argument only, that this is true, it is clear that claim 1 defines patentably over the art of record, for same reasons as applied above with respect to claim 8.

Specifically, claim 1 defines a step of diagnosing the risk of corrosion of the pipe or pipeline based on an empirical combination of the actual corrosion of the first probe part, the calculated spread resistance, and the measured AC voltage. As discussed above with respect to claim 8, nothing in the cited art teaches or suggests a diagnosing step as defined in claim 1. The processor in Nielsen et al., for example, performs the step of determining the actual corrosion, but there is no suggestion in the cited art of using this parameter, in an empirical combination with other (measured or calculated) parameters, to provide a diagnosis of corrosion risk.

Furthermore, claim 1, like claim 8, has been amended to define the concept of performing the AC current measuring step while the probe is electrically connected to the pipe, and performing the AC voltage measuring step and the excitation current passing steps (for measuring the resistance of the first and second probe parts) while the probe is electrically disconnected from the pipe. To this end, claim 1 has been amended to recite the step of electrically connecting the probe and the pipe before the step of measuring the AC current, and then electrically disconnecting the probe from the pipe before the step of measuring the AC voltage. As discussed above with respect to claim 8, the cited references contain no teaching or suggestion of electrically connecting the probe to the pipe to perform the AC current measurement, and then electrically disconnecting the probe from the pipe to perform the measurements of the probe resistance. Therefore, it is respectfully submitted that amended claim 1 defines patentably over the art of record for the same reasons as set forth above with respect to claim 8, and should be allowed. Claims 2-7, which depend from claim 1 and further define the patentable subject matter of the claimed invention, should likewise be allowed.

Objections to the Drawings and Specification

Figure 2A was objected to because the reference number 26 mentioned in the specification was not found in this figure. This objection has been addressed by amending the specification to correct the erroneous reference number “26” to the correct reference number “56,” which does appear in the figure.

Figure 2B was objected to because of insufficient explanation of the function of the various parts of the circuit shown therein, and because the overall quality of the figure was poor. These objections have been addressed by providing a substitute drawing sheet with an enlarged and clarified Fig. 2B, and by labelling the circuit shown in Fig. 2B with the reference number 46, thereby indicating that it is the current excitation block 46 depicted in Fig. 2A, and discussed in the specification at page 19, lines 9-12 and 18-21. (The specification has been amended to clarify this point.)

The Examiner has pointed out several specific informalities in the specification that have been corrected by the amendments to the specification set forth above. Several other minor grammatical errors and/or informalities have been noted and corrected by amendment.

Applicant notes the Examiner’s objection to the portion of the specification labelled as “annexes.” It is respectfully submitted that the portions so labelled are part of the disclosure, and that they may be meaningful to those skilled in the pertinent arts. Applicant is aware of no requirement that a part of the disclosure that may impart meaningful information about the claimed invention be cancelled or removed. The Applicant would be willing to comply with any reasonable suggestion by the Examiner for another format for these portions of the specification. In this regard, the undersigned Attorney, on behalf of the Applicant, thanks Examiner Baldrige for the courteous and helpful telephonic interview conducted on November 12, in which the issue of the annexes was discussed. It was agreed that the Examiner will offer suggestions for an appropriate resolution to this issue after reconsideration of the allowability of the claims upon consideration of the amendments and remarks herein.

In summary, it is respectfully submitted that claims 1-11, as amended, are patentable over the art of record, and should be allowed. All of the objections being addressed, it is respectfully submitted that the application is now in condition for allowance. Passage of the application to issue is therefore earnestly solicited.

US Patent App. No. 10/591,226
Resp. to Office Action Mailed May 12, 2008

If there are any issues remaining in the application, the Examiner is respectfully requested to telephone the undersigned attorney to expedite the prosecution of the application to issue.

Date: Nov. 12, 2008

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'H. Klein', written over a horizontal line.

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